

LITHOLOGIC DESCRIPTION

GETTY OIL CO. #9-D
NW $\frac{1}{4}$, NW $\frac{1}{4}$, SEC 4, T5S, R97W, GARFIELD COUNTY, COLORADO

CORE DESCRIPTION

655.3 - 659.7

Oil shale - light to medium brownish gray with some dark brownish gray; HCl - no; earthy to satiny luster; laminated with zones of dark brownish gray exhibiting common loop structures, streaked and distorted bedding; irregular tuff at 659.4; fractured throughout with some slightly calcareous coatings and some solution vugs. 657.85 - 658.9 missing.

659.7 - 668.6

Oil shale - light, medium and dark brownish gray; HCl - no to minor; earthy to satiny luster; laminated with some loop structures and distorted bedding; rare tuff stringers and blebs throughout; rare fractures throughout; recored at 664.0.

668.6 - 671.9

Oil shale - light to medium brownish gray with rare dark brownish gray; HCl - minor; earthy luster; laminated with rare loop structures; highly fractured and broken above missing interval. 670.6 - 671.9 missing.

671.9 - 676.3

Oil shale - light to medium brownish gray with rare dark brownish gray; HCl - minor to yes; earthy with rare satiny luster; laminated with dark brownish gray laminae and zones exhibiting distorted bedding; some tuff blebs and stringers throughout; solution vugs (small) at top of interval.

676.3 - 678.4

Oil shale - light, medium and dark brownish gray; HCl - no; earthy with rare

- satiny luster; laminated with common distorted bedding; high distortion at 676.4 associated with numerous small tuffs; fractures throughout interval with high core breakage at 678.0, fracture set intersection.
- 678.4 - 682.8 Mudstone with rare oil shale - buff to light brownish gray with rare medium brownish gray; HCl - minor; chalky to earthy luster; laminated with rare looped structures and some distorted bedding; highly fractured throughout interval.
- 682.8 - 687.9 Oil shale - light, medium and dark brownish gray; HCl - no; earthy with some satiny luster; laminated with some loop structures and common distorted bedding; fracturing in interval with some grinding of core at bottom. 683.2 - 683.3 missing.
- 687.9 - 690.2 Oil shale - light to medium brownish gray with rare dark brownish gray streaks; HCl - minor to yes; laminated with rare streaked bedding; fractured throughout with common jumbling and breaking at top.
- 690.2 - 693.1 Oil shale - light, medium and dark brownish gray; HCl - no; earthy to satiny with rare waxy luster at 690.6; laminated with rare loop structures and some streaked and distorted bedding, laminations distorted by tuffs at 691.0 and 692.7; oil impregnated tuffs and oil coated fractures 692.0 - 693.0; slickensides at 692.1; common fractures throughout.
- 693.1 - 697.0 Oil shale and mudstone - buff to light brownish gray; HCl - minor; chalky to earthy luster; laminated with rare dark laminae and distorted bedding; tuffs common throughout with tuff/oil shale layer from 696.4 to bottom; common solution and fracturing throughout; core highly jumbled.
- 697.0 - 703.3 Oil shale - medium to dark brownish gray; HCl - no; earthy luster; common streaked and distorted bedding, rare laminations; nahcolite(?) zone at 698.0 approximately

0.1 ft., high angle fractures with slickensides 699.0 - 701.0; rare light-colored tuffs from 701.75 to bottom.

703.3 - 710.0

Oil shale - light, medium and dark brownish gray; HCl - no; earthy luster; laminated with some loop structures and distorted bedding; tuff layer at 706.3 with minor tuffs above and tuff stringers more common towards bottom; common fractures top and bottom of interval.

710.0 - 716.4

Oil shale with some marlstone - light to medium brownish gray with some dark brownish gray; HCl - minor to yes; earthy luster; laminated with rare distorted bedding; highly broken along fractures with oil staining on fractures 714.0 - 716.0; tuff at 712.4 and 712.6 with common tuff stringers throughout.

716.4 - 725.75

Mudstone and siltstone - buff to light brownish gray; HCl - no to minor; chalky luster; laminated to banded with some distorted bedding; broken by fractures throughout interval; some soft tuffs 721.0 - 722.0; jumbled into small pieces bottom of interval. 723.2 - 725.1 missing.

725.75 - 727.0

Oil shale - medium to dark brownish gray with rare light brownish gray; HCl - no; laminated with common streaked bedding, laminations distorted by solution cavity at 726.5 - 726.75; two intersecting fractures bottom of interval; soft analcitized tuffs with oil shale common to 726.2.

727.0 - 736.8

Oil shale - light, medium and dark brownish gray; HCl - no; earthy luster; laminated with light brownish gray zones 730.0 - 731.0; fractured from 731.0 to bottom with large open fracture 733.0 - 735.6; rare tuff stringers throughout with irregular tuff distorting bedding at bottom.

736.8 - 749.15

Oil shale - light, medium and dark brownish gray; HCl - no; earthy luster; laminated to faintly laminated towards bottom, rare loop structures and distorted bedding; irregular tuff at top with interbedded soft tuffs and oil

shale 741.55 - 742.3; common fractures throughout. 741.35 - 741.55 missing.
BOTTOM OF R-6.

749.15- 761.9

Oil shale, tuff, and mudstone - light gray and buff to light brownish gray with rare medium brownish gray; HCl - no to minor; chalky to earthy luster; laminated to massive; characterized by discontinuous nature of rock; to 750.3, highly fractured and jumbled; soft tuffs and mudstone to 752.0; to 756.3, oil shale with tuffs and cavities/vugs of analcite; to 758.0, mudstone and shale with tuffs to 0.3 ft.; 760.1 to bottom, oil shale with large cavities of analcite and calcite, with abundant pyrite; common fractures throughout interval; interval consolidated due to footage difficulties and rock properties (poor quality throughout). 758.0 - 760.1 missing.

761.9 - 766.1

Oil shale - light to medium brownish gray with rare greenish brown; HCl - no; earthy luster; laminated with common streaked and distorted bedding; fractured throughout interval, fractures more common towards bottom; rare tuff stringers and blebs throughout.

766.1 - 772.3

Oil shale and mudstone - light to medium brownish gray; HCl - minor; earthy luster; laminated with common streaked bedding; fractured, jumbled, and broken throughout; some solution of vugs of analcite and pyrite throughout, more common towards bottom; soft, partially dissolved tuffs at 767.7 and 768.5.

772.3 - 777.0

Siltstone and sandstone - gray to light brownish gray, rare medium brownish gray layers and laminae; HCl - minor to yes; faintly laminated to massive; crystalline vugs throughout; soft altered tuffs at 775.3 and 775.7; fractured throughout, heavily jumbled 774.0 to bottom.

777.0 - 781.6

Oil shale - medium to dark brownish gray with rare greenish brown; HCl - no; earthy luster; laminated with common streaked bedding; shaly parting to 778.0; common tuff stringers throughout with analcitized tuff at 780.5 (0.1 ft); rare fracturing with oil stained fracture at 781.0.

- 781.6 - 783.8 Oil shale/marlstone - buff to light brownish gray with rare medium brownish gray; HCl - yes; earthy luster; laminated to banded, with rare distorted bedding; some tuff stringers throughout; fractured throughout interval.
- 783.8 - 786.15 Oil shale - light to medium brownish gray; HCl - minor; earthy luster; laminated to faintly laminated; fracture sets throughout; tuff stringers common throughout.
- 786.15- 797.7 Sandstone and siltstone with rare mudstone - gray to light brownish gray or buff; HCl - no; chalky luster; banded to massive with bedding distorted along bedding planes to 791.0; heavy solution in interval; fractures common from 790.5 to bottom with heavy jumbling of core above missing intervals. 792.5 - 793.4 missing. 795.9 - 797.6 missing.
- 797.7 - 803.3 Oil shale - light, medium and dark brownish gray; HCl - no to minor; earthy luster; laminated with rare loop structures and common streaked bedding; fractured throughout, more prevalent from 797.7; tuffs 799.0 and 801.8; solution cavity at 799.5; analcite cavity with pyrite at 800.7.
- 803.3 - 808.5 Siltstone with rare oil shale - gray to light brownish gray and buff; HCl - no to minor; earthy luster; varved to banded; fractured throughout interval with large open fracture from 807.8 to bottom, fracture filling is white, non-calcareous, with some yellow (SO₄?); common tuff stringers throughout; gouge-like material at top of interval; soft tuff at 804.3; core reground and jumbled above missing interval. 805.0 - 805.5 missing.
- 808.5 - 814.8 Sandstone - gray; HCl - minor; earthy luster; banded to laminated with common, irregular medium brownish gray silt layers throughout; micro-faulting common upper portion; large, open fracture to 809.0 (see above), fracturing lower portion; steel gray tuff 811.0 - 811.2 Correlation - 50 feet below R-6?
- 814.8 - 819.1 Mudstone/oil shale - gray to light and medium brownish gray; HCl - minor; earthy

- luster; laminated with some distorted bedding; large, open fracture to 818.2.
- 819.1 - 820.1 Oil shale - light, medium and dark brownish gray; HCl - minor; earthy luster; faintly laminated with some streaked bedding; rare tuff stringers lower portion.
- 820.1 - 823.3 Mudstone with some oil shale - gray to light brownish gray with some medium brownish gray; HCl - no; earthy luster; laminated with rare distorted bedding; large open fracture from top to 821.4; irregular gray tuff at 822.4.
- 823.3 - 829.4 Oil shale - medium to dark brownish gray with some light brownish gray; HCl - no; earthy luster; laminated with some distorted and common streaked bedding; rare tuffs throughout with gray tuffs 828.5 and 829.3.
- 829.4 - 834.0 Sandstone - gray to light and medium brownish gray; HCl - yes; chalky luster; varved to banded with common distorted bedding, rare oil shale laminae towards bottom; some very thin steel gray tuffs throughout.
- 834.0 - 836.8 Oil shale - light, medium and dark brownish gray; HCl - minor to yes; earthy with rare satiny luster; laminated at top with common streaked and distorted bedding from 834.6, some silty layers upper portion; altered tuffs with associated pyrite common to 835.0; rare gilsonite 835.0 - 836.0; very tight (40°) fractures to 835.0 detected upon breaking.
- 836.8 - 848.0 Sandstone and siltstone - gray with medium brownish gray; HCl - yes; chalky luster; banded to massive with rare kerogen-rich laminae; common distorted bedding; open vertical fracture with white filling 845.5 to bottom.
- 848.0 - 857.8 Oil shale - light, medium and dark brownish gray with some greenish brown 851.0 - 853.0; HCl - yes; earthy with rare satiny luster; laminated with rare loop structures, common streaked and distorted bedding; lean section 851.0 - 853.0; analcitized tuffs with oil shale 848.0 - 848.35, tuff

at 848.85 and 855.5, irregular tuff blebs
857.5. 853.3 - 853.75 Compressive
Strength Sample.

857.8 - 863.8

Siltstone with some sandstone grading into marlstone - gray to medium brownish gray; HCl - yes to minor; chalky to earthy luster; laminated to banded with common streaked bedding lower portion, common distorted bedding throughout; one minor fracture at bottom.

863.8 - 866.3

Oil shale - medium to dark brownish gray with rare light brownish gray; HCl - yes; earthy luster; common streaked and distorted bedding; large, open fracture from 864.5 to bottom.

866.3 - 867.3

Sandstone - gray to medium brownish gray; HCl - yes; chalky luster; common, wavy, distorted laminae and stringers of medium brownish gray silt throughout; large open fracture throughout.

867.3 - 875.2

Oil shale - medium to dark brownish gray and greenish brown with rare light brownish gray; HCl - no; earthy luster; rare, faint laminations with common streaked and distorted bedding; rare dense crystal masses 869.4; rare gilsonite 873.9 - 876.0; rare tuff stringers and blebs throughout; very tight fracture 875.0 - 876.0.

875.2 - 878.2

Marlstone - buff to light brownish gray with some medium to dark brownish gray; HCl - yes; earthy luster; banded with rare laminations and common streaked and distorted bedding; 875.0 - 876.0 contains highly distorted, silty laminae; very tight fractures present throughout interval.

878.2 - 880.8

Sandstone and siltstone - buff to dark brownish gray; HCl - yes; chalky to earthy luster; highly contorted laminations throughout interval.

880.8 - 883.6

Oil shale - light brownish gray with some medium to dark brownish gray; HCl - minor; earthy luster; laminated with rare loop structures, common distorted bedding; some very tight, vertical fractures in interval.

883.6 - 901.3

Oil shale - medium to dark brownish gray with some light brownish gray; HCl - no; earthy luster; rare, faint laminations, common streaked and distorted bedding; rare blebs of gilsonite to 886.0; solution of tuff with quartz 893.9 - 894.0; tuff at 895.95; tight fracture(?) 0°, 894.0 - 895.0; fractured across bedding 897.0 - 900.0.

901.3 - 910.9

Sandstone and siltstone - gray to medium brownish gray; HCl - yes; chalky luster; laminated to massive with common distorted bedding, some microfaulting throughout; rare tuff streaks and stringers throughout; fracture trace 908.0 - 909.0.

910.9 - 913.9

Oil shale - light, medium and dark brownish gray; HCl - no; earthy luster; laminated to faintly laminated with rare streaked and distorted bedding; dark brownish gray tuff at 913.15 - 913.3.

913.9 - 917.2

Siltstone and sandstone - buff to light brownish gray; HCl - yes; chalky luster; laminated with common gray sand laminae and some medium to dark grayish brown kerogen-rich laminae, rare distorted bedding.

917.2 - 920.95

Oil shale - light, medium, and dark brownish gray; HCl - no; earthy luster; laminated with common streaked bedding and some distorted bedding; tuff layer distorting bedding at 918.8 and tuff blebs at 919.4; very tight vertical fracture 917.0 - 919.0.

920.95- 930.2

Siltstone and sandstone - gray to medium brownish gray; HCl - yes; chalky luster; laminated to banded; sandstone is gray with brownish silt, highly distorted bedding 923.8 and 927.0 - 928.0, rare kerogen-rich laminae more prevalent toward bottom. Note: Pattern of silty sand or sandy silt separating oil shale sections has been very prevalent. The picks of footage are based on gradation because of the gradual change. The 930.2 footage is the last consistent stringer of gray sand before oil shale.

- 930.2 - 934.5 Oil shale - medium to dark brownish gray with rare light brownish gray; HCl - no; earthy luster; laminated with rare distorted bedding; gray tuffs 932.5 and 933.8.
- 934.5 - 941.9 Sandstone and siltstone - gray to medium brownish gray; HCl - yes; chalky luster; laminated to banded with distorted bedding; rare oil shale laminae throughout, more frequent towards bottom; faint fracture trace 935.2.
- 941.9 - 947.5 Oil shale (lean) - medium to dark brownish gray with some light brownish gray; HCl - no to minor in light colored areas; earthy luster; rare laminations, common streaked bedding with some distortion; rare gilsonite flecks 944.0 - 946.0.
- 947.5 - 948.8 Sandstone and siltstone - gray to medium brownish gray; HCl - yes; chalky luster; laminated with common distorted bedding; rare tuff streaks and stringers lower portion.
- 948.8 - 960.0 Oil shale - light, medium and dark brownish gray; HCl - no to minor; earthy with rare satiny luster; rare laminations, common streaked and distorted bedding; rare calcareous sand/silt laminae to 953.0 and from 959.0 to bottom; fractured from 950.0 - 950.8; gray tuff 951.6; fracture(?) 952.0 and 954.0; analcitized, irregular tuff with gilsonite 957.0; tuffs 957.7 and 958.6; rare tuff streaks and stringers throughout.
- 960.0 - 964.55 Siltstone and sandstone - gray to medium brownish gray; HCl - yes; chalky luster; laminated to massive with common distorted bedding; microfaulting upper portion.
- 964.55- 980.0 Oil shale - medium to dark brownish gray with some light brownish gray top and bottom; HCl - no to minor in light colored sections; earthy to satiny luster; laminated with common streaked and distorted bedding, rare loop structures; fractured 968.0 - 969.0; shaly parting 975.4 - 976.0; tuffs 967.0 and 978.4; rare gilsonite streaks lower portion; 970.0 - 973.0 rare tuff blebs. Correlate with 1300' - Cities Service.

- 980.0 - 986.8 Siltstone and sandstone - gray to medium brownish gray; HCl - yes; chalky luster; laminated to massive with common distorted bedding and rare microfaulting; fracture trace 981.0 - 982.0 and 985.0 to bottom; rare kerogen-rich laminae becoming more prevalent toward bottom.
- 986.8 - 993.65 Oil shale - medium to dark brownish gray with rare light brownish gray; HCl - no; earthy to satiny luster with rare waxy luster; faintly laminated with common streaked and distorted bedding, rare loop structures; fracture trace 991.0 - 992.0; rare gilsonite flecks throughout.
- 993.65- 998.5 Marlstone and sandstone - medium to light brownish gray with some gray; HCl - minor to yes; earthy luster; massive to banded with common gray sand laminae and rare kerogen-rich laminae, quantity of sand decreases towards bottom; fractured at 995.4.
- 998.5 -1001.65 Oil shale - medium to dark brownish gray with rare light brownish gray; HCl - no to minor; earthy with some satiny luster; laminated with common streaked bedding, rare distorted bedding; tuff blebs and stringers 999.0 - 1000.0; rare gilsonite flecks 1000.0 to bottom; irregular analcitized tuff 1000.7.
- 1001.65-1008.2 Siltstone and sandstone - medium brownish gray to gray; HCl - yes; chalky to earthy luster; laminated to banded with common distorted bedding middle portion; some marlstone upper section; rare kerogen-rich laminae throughout; minor drilling breakage at 1004.0.
- 1008.2 - 1017.6 Oil shale - medium to dark brownish gray with some greenish brown and rare light brownish gray; HCl - no to minor; earthy luster; laminated to banded with some distorted bedding; rare tuff blebs 1009.0 - 1010.0, tuff layer at 1011.2; rare tuff streaks and stringers 1013.0 - 1014.0; fractured 1014.2; rare, tight fracture traces 1015.0 - 1016.0.
- 1017.6 -1021.35 Siltstone and marlstone - light brownish gray to greenish brown with rare gray sand

- laminae; HCl - minor to yes, earthy luster; laminated to massive with some kerogen-rich laminae, some distorted bedding.
- 1021.35-1033.1 Oil shale - light, medium and dark brownish gray; HCl - no to minor; earthy luster; laminated with rare streaked bedding, some sandy stringers 1025.0 - 1027.0; soft, altered tuff 1023.65 - 1023.9; gray tuff at 1029.4; altered tuff at 1031.1; rare, discontinuous fracture traces throughout interval.
- 1033.1 -1042.3 Siltstone, mudstone and sandstone - gray to light brownish gray and greenish brown; HCl - minor to yes; chalky to earthy luster; laminated to massive with common distorted bedding, rare kerogen-rich laminae upper and lower portion; tuff blebs 1038.9 and 1039.2; rare blebs and stringers to bottom.
- 1042.3 -1052.5 Oil shale - light, medium and dark brownish gray; HCl - no; earthy with rare satiny luster; laminated with rare loop structures, some distorted and streaked bedding; fractured 1044.1 - 1044.4; rare tuff streaks, stringers and blebs throughout with tuff flow structure 1051.0 - 1051.5; rare gilsonite streaks 1051.0 to bottom.
- 1052.5 -1054.4 Mudstone and oil shale - greenish brown to medium and dark brownish gray; HCl - no; earthy luster; laminated with common distorted bedding and rare streaked bedding.
- 1054.4 -1060.75 Oil shale - medium to dark brownish gray with some light brownish gray, rare greenish brown lower foot; HCl - no; earthy with some satiny and rare waxy luster; laminated with some streaked bedding and loop structures, rare distorted bedding; fractured at top and 1056.8; irregular tuff at 1058.5.
- 1060.75-1063.7 Siltstone and sandstone with some oil shale - gray to medium brownish gray; HCl - minor to yes; chalky to earthy luster; laminated with common streaked and distorted bedding; gray tuff at 1063.4.

1063.7 -1071.2

Oil shale - light, medium and dark brownish gray with rare greenish brown; HCl - no; earthy with rare satiny luster; laminated with common streaked and distorted bedding; irregular tuffs at 1065.6, tuff blebs and stringers at 1065.5, 1067.7, 1068.4, 1068.8 and 1071.0.

1071.2 -1077.9

Oil shale - light, medium and dark brownish gray; HCl - no to minor; earthy with rare satiny luster; some laminations with common loop structures; common streaked and distorted bedding, slump structure to 1072.0 and from 1076.7 - 1077.0; common tuff blebs and stringers throughout with analcitized tuff from 1077.2 - 1077.5; some microfaulting throughout.

1077.9 -1093.45

Oil shale - medium to dark brownish gray with some light brownish gray; HCl - no; satiny with some earthy and rare vitreous luster; laminated with some loop structures and distorted bedding; layers of analcitized tuff 1081.5 - 1081.7, 1081.8, 1082.4 - 1082.65, 1083.1 - 1083.3, 1083.6, 1083.8, 1084.15 - 1084.35, 1090.9 and 1091.0; vertical fracture from 1084.0 - 1086.5 and 1087.2 - 1087.4, upper fracture has soft, white, scaly filling, easily dissolved in water.

1093.45-1097.65

Marlstone and siltstone - light brownish gray, buff, and greenish brown with rare medium and dark brownish gray; HCl - minor to yes; earthy luster; laminated to banded with common distorted bedding, some kerogen-rich laminae, bedding distorted by some tuff layers, blebs and stringers throughout; analcitized tuff 1094.7 - 1094.9.

1097.65-1101.9

Oil shale - medium to dark brownish gray with rare light brownish gray; HCl - no; earthy with common satiny and rare vitreous luster; laminated with common loop structures, streaked and distorted bedding; common tuff blebs throughout, locally distorting bedding.

1101.9 -1107.5

Marlstone and oil shale - greenish brown to light and medium brownish gray; HCl - yes to minor; earthy luster; laminated with some sandy laminae throughout, some distorted bedding; fractures throughout

with major fracture 1105.5 - 1107.3;
slickensides in fracture at 1102.5.
1101.8 - 1102.35 Compressive Strength
Sample.

1107.5 -1111.4

Oil shale - medium to dark brownish gray
with rare light brownish gray; HCl - no;
earthy to satiny luster; laminated with
rare loop structures, common distorted
bedding; fractured from 1108.0 - 1109.5;
tuff layer at 1110.9.

1111.4 -1116.6

Siltstone with some oil shale - buff to
light brownish gray with rare medium to
dark brownish gray; HCl - minor to yes;
earthy luster; laminated with some
distorted bedding; rare tuff blebs and
stringers lower portion.

1116.6 -1119.8

Oil shale - medium to dark brownish gray
with rare light brownish gray; HCl - no;
earthy with some satiny luster; common
laminations and streaked and distorted
bedding.

1119.8 -1123.0

Marlstone - greenish brown, light to
medium brownish gray; HCl - minor; earthy
luster; laminated with common distorted
bedding, rare loop structures; silty
layers at 1121.0 and 1121.6; tight vertical
fractures from 1121.0 - 1122.3.

1123.0 -1126.0

Oil shale - light, medium and dark brown-
ish gray; HCl - no; earthy with rare
satiny luster; laminated with common
streaked and distorted bedding; analci-
tized tuffs 1123.5 and 1124.5, rare tuff
streaks throughout. 1125.7 - 1126.25
Compressive Strength Sample. TOP R-4(?)

1126.0 -1130.1

Marlstone with some oil shale - greenish
brown to light and medium brownish gray;
HCl - minor; earthy luster; laminated
with common distorted bedding.

1130.1 -1133.6

Oil shale - medium to dark brownish gray
with some greenish brown lower portion;
HCl - no; earthy with rare satiny luster;
laminated with rare streaked bedding;
analcitized tuff at 1131.3, fractured
from 1130.8 - 1132.0, slickensides at
1132.3.

- 1133.6 -1138.5 Oil shale - light, medium and dark brownish gray; HCl - no to minor; earthy luster; laminated with common streaked and distorted bedding; analcitized tuffs 1137.2 and 1138.1; gilsonite stringer at 1134.2.
- 1138.5 -1141.45 Oil shale - medium to dark brownish gray; HCl - no; satiny to resinous with rare earthy luster; laminated with some loop structures and distorted bedding; rare tuff stringers throughout.
- 1141.45-1144.4 Marlstone and oil shale - greenish brown to medium grayish brown; HCl - minor to yes; earthy luster; laminated with common distorted bedding; analcitized tuffs 1143.0, 1143.8 and 1141.8.
- 1144.4 -1157.7 Oil shale - medium to dark brownish gray with common light brownish gray upper portion; HCl - no to yes (upper portion); earthy to satiny luster; laminated with common streaked and distorted bedding; rare slump and microfracture features to 1146.0; tuffs 1144.9, 1148.6, 1157.0, 1156.6 and 1156.9. BOTTOM R-4(?)
- 1157.7 -1172.8 Marlstone with common interbedded sands and silts - gray to bluish gray with light brownish gray and rare medium brownish gray; HCl - yes; chalky to earthy luster; laminated with common distorted bedding and rare cross-bedding; common shaly parting 1166.0 to bottom; vertical fractures 1166.4 - 1167.0, 1170.4 - 1172.0 and 1172.5 to bottom; scaly white fracture fillings. 1168.4 - 1168.9 Compressive Strength Sample.
- 1172.8 -1180.4 Oil shale with common marlstone - light, medium and dark brownish gray; HCl - minor to yes; earthy luster; laminated with common streaked and distorted bedding; bedding distorted by tuffs at top, 1175.0, and 1176.0; some tuff streaks and layers throughout; fractured from 1174.8 - 1176.0.
- 1180.4 -1187.9 Siltstone and sandstone - light to medium brownish gray silts with interbedded gray sands; HCl - yes; earthy luster; interbedded laminations with common distortion, small slump features and highly irregular

bedding; rare tuff streaks throughout with tuff layer at 1185.0.

1187.9 -1191.0

Oil shale and marlstone - light, medium and dark brownish gray; HCl - no to minor; earthy with rare satiny luster; laminated with common distorted and some streaked bedding; gilsonite stringer at 1188.4; analcitized tuff at bottom.

1191.0 -1192.6

Siltstone and sandstone - light to medium brownish gray silts with interbedded gray sands; HCl - yes; earthy to chalky luster; laminated with common irregular and distorted bedding; tight fracture at 1191.5; common analcitized tuff blebs throughout.

1192.6 -1209.6

Oil shale and marlstone - light, medium and dark brownish gray; HCl - no to yes; earthy with rare satiny luster; laminated with common distorted bedding; zones of interbedded sands and tuffs at 1200.0 - 1203.0; shaly parting 1208.6 to bottom.

1209.6 -1218.25

Marlstone and siltstone - greenish brown to light and medium brownish gray; HCl - yes; earthy luster; laminated to banded with some interbedded gray sands, common distorted and microfaulted bedding throughout; fractured 1215.4 - 1215.7; some shaly parting top of interval.

1218.25- 1220.6

Oil shale - light, medium and dark brownish gray; HCl - no; earthy with rare satiny luster; laminated with some streaked and distorted bedding; tuff layer at 1219.3, rare tuff stringers throughout.

1220.6 -1230.85

Marlstone - greenish brown to light and medium brownish gray; HCl - yes; earthy to resinous luster (on parting surfaces); laminated to banded with common interbedded silts and sands, rare kerogen-rich laminae; common shaly parting throughout.

TOTAL DEPTH